

American Geophysical Union 2010 Fall Meeting Special Issue!

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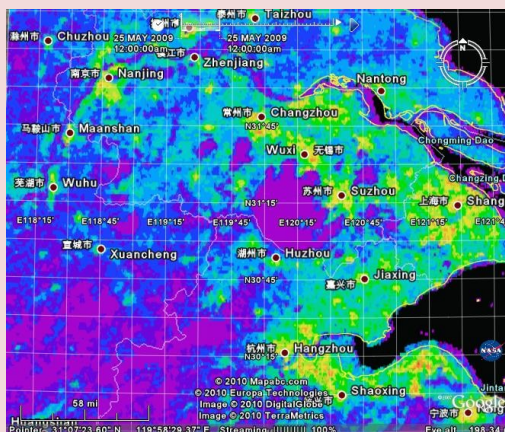
As this issue of *The Giovanni News* goes to 'press,' new publication references are still being added to the 2010 list of peer-reviewed journal papers which utilized Giovanni for research. The current total is well over 100 publications for this calendar year. The increasingly broad usage of Giovanni in many sectors of earth science is obvious in this new stack of publications: from dust in Asia to ozone in the Himalayas to chlorophyll in the lagoons of New Caledonia to erosion in Uganda and geohazards near Machu Picchu. Giovanni has been established as a vital, fundamental tool for Earth science investigations using NASA data.

MAIRS 8-day, 1 km land surface temperatures for Asia released in Giovanni

The Goddard Earth Science Data and Information Service Center's (GES DISC) innovative data analysis system [Giovanni](#) is now hosting a new interface featuring increased spatial (1 kilometer) and temporal (8-day intervals) resolution land surface temperature data. The data interface, created to support regional investigations for the [Monsoon Asia Integrated Regional Study \(MAIRS\)](#), provides land surface temperature data from the Moderate Resolution Imaging Spectroradiometer (MODIS) instruments onboard NASA's Terra and Aqua earth observation satellites. Data products combining these spatial and temporal resolutions have not been available in Giovanni before, and they offer new capabilities for meteorological and climate research.

These data products are now accessible from the Giovanni [mairs_8day](#) interface. The spatial coverage of these products in Giovanni is the Asia monsoon region (60°E-150°E, 0°-60°N) to support regional studies in the MAIRS program. The increased resolution data make it possible to study local climate variations, associated with variable land cover, and land use change due to urbanization and agriculture. The data can also assist in monitoring of forest fire events.

The data are available from March 2000 for MODIS-Terra (and July 2002 for MODIS-Aqua), and are updated as new data products arrive. The README document for [MODIS 8-day 1km Land Surface Temperature in Giovanni](#) describes how the data in Giovanni are processed from the standard MODIS 8-day 1 km Land Surface Temperature & Emissivity products, MOD11A2.005 and MYD11A2.005, respectively. ("MOD" represents data from MODIS-Terra, "MYD" represents data from MODIS-Aqua).



Land surface temperatures of east central China, from the Giovanni MAIRS 8-day interface, averaged over summer 2009, and displayed in Google Earth. Elevated urban temperatures compared to rural areas and lakes are evident in this image.

GES DISC Presentations

at the American Geophysical Union 2010 Fall Meeting

(Giovanni-related presentations are titled in **Green**; other presentation titles in **Orange**)

Monday, December 13, 2010

NASA Giovanni Tool for Visualization and Analysis Support for the YOTC Program

Dana Ostrenga; Gregory G. Leptoukh ; Duane E. Waliser; Zhong Liu; Andrey K. Savtchenko

Poster, Moscone South, A11D-0086

What it's about: Expansion of the GES DISC Giovanni tool to facilitate research with Year of Tropical Convention (YOTC) data sets. Plotting of vertical profiles and maps with Level 2 and Level 3 data, and access to corresponding data products, is featured in this Giovanni interface.

Cross-Characterization of Aerosol Properties from Multiple Spaceborne Sensors Facilitated by Regional Ground-Based Observations

Maksym Petrenko ; Charles M. Ichoku; Gregory G. Leptoukh

Poster, Moscone South, A11E-0104

What it's about: Design and implementation of the online Multi-sensor Aerosol Products Sampling System (MAPSS), facilitating joint sampling of aerosol data from multiple sensors. MAPSS supports aerosol products from the Terra-MODIS, Aqua-MODIS, Terra-MISR, Aura-OMI, Parasol-POLDER, and Calipso-CALIOP satellite instruments. MAPSS consistently samples aerosol products from multiple spaceborne sensors using a unified spatial and temporal resolution, where each data set is sampled over Aerosol Robotic Network (AERONET) locations together with coincident AERONET data samples.

A Semantic Provenance-aware Expert Advisory System in a Web-based Science Data Analysis Tool

Stephan Zednik; Christopher Lynnes; P. A. Fox; Gregory G. Leptoukh

Poster, Moscone South, IN11A-1069

What it's about: Creation of a semantic, provenance-aware, expert-knowledge advisory system to assist users in understanding and interpreting results obtained using a Web-based Earth science data analysis tool.

Rebuilding and Organizing 1960's era Nimbus Datasets to 2010 Data Stewardship Expectations

John F. Moses; Steven J. Kempler; Atheer Al-Jazrawi; E. Zamkoff; Irina V. Gerasimov; James E. Johnson; Bhagirath M. Trivedi

Poster, Moscone South, IN11A-1071

What it's about: NASA's Nimbus satellite data include Earth observations taken by visible and infrared imaging and sounding instruments flown onboard platforms in near-polar sun-synchronous orbits from 1964 through 1978. The original observations have been retained on film and on magnetic tape. This presentation will illustrate methods required to establish the utility of this valuable Nimbus record for future Earth science research studies.

Results of the Collaborative Energy and Water Cycle Information Services (CEWIS) Workshop on Heterogeneous Dataset Analysis Preparation

Steven J. Kempler; William L. Teng; James G. Acker; Deborah R. Belvedere; Zhong Liu; Gregory G. Leptoukh

Poster, Moscone South, IN11B-1081

What it's about: Findings of the Collaborative Energy and Water Cycle Information Services (CEWIS) workshop, held June 15-16, 2010 at Goddard Space Flight Center. The workshop was intended to determine the data preparations, challenges, and roadblocks encountered by NASA Energy and Water Cycle (NEWS) PI Teams to perform heterogeneous multi-data science/validation, and to receive feedback regarding potential solutions to roadblocks in the process of combining distributed heterogeneous data sets.

Tuesday, December 14

Community-based Services that Facilitate Interoperability and Inter-comparison Between Precipitation Data Sets from Multiple Sources

Zhong Liu; Steven J. Kempler; William L. Teng; Gregory G. Leptoukh; Dana Ostrenga

Poster, Moscone South, H21E-1085

What it's about: Interoperability services can be directly applied to future data sets, such as those from the Global Precipitation Measurement (GPM) mission. This presentation describes the data sets and services at the Precipitation Data and Information Services Center (PDISC) that are currently used by precipitation science and applications researchers, and which will be enhanced in preparation for GPM and associated multi-sensor data research.

Importance of Vertical Coupling in Agricultural Models on Assimilation of Satellite-derived Soil Moisture

I. E. Mladenova; W. T. Crow; William L. Teng; P. Doraiswamy

Poster, Moscone South, H23F-1276

What it's about: This research examines: (1) the strength of the vertical coupling in the Environmental Policy Integrated Climate (EPIC) model over corn and soybeans covered fields in Iowa, US; (2) the potential to improve EPIC root zone soil water (RZSW) information through assimilation of satellite soil moisture data derived from the Advanced Microwave Scanning Radiometer (AMSR-E); and (3) the impact of the vertical coupling on the Ensemble Kalman Filter (EnKF) data assimilation system performance.

Towards Consistent Characterization of Quality and Uncertainty in Multi-sensor Aerosol Level 3 Satellite Data

Gregory G. Leptoukh

Talk, Moscone West 3008, 8:28 AM, A21J-03

What it's about: This presentation describes the motivation for, and the development of, a framework for aerosol data users to systematically characterize, capture, and provision quality and uncertainties in Level 3 satellite data.

Ambiguity of Data Quality in Remote Sensing Data

Christopher Lynnes, Gregory G. Leptoukh

Talk, Moscone South 302, 5:15 PM, IN24A-06

What it's about: In this presentation, the authors present the various characteristics of “data quality” in remote sensing data, encompassing pixel level, file level, and data set (product) quality factors. For the latter, quality usually refers to how accurately the data set is believed to represent the physical quantities it purports to measure, which may only have an indirect relationship to pixel level quality.

Reminder:



Giovanni has a Facebook group: *NASA Giovanni Remote Sensing Data Analysis*

And there are two related Twitter feeds:

nasa_gesdisc and **nasa_giovanni**

follow us on
twitter

New and Improved GLDAS and NLDAS data sets and data services at HDISC/NASA

H. Rui *; H. K. Beaudoin; D. M. Mocko; M. Rodell; W. L. Teng; B. Vollmer

Poster, Moscone South, H31H-1100

What it's about: This presentation will cover the basic characteristics of the Global Land Data Assimilation System (GLDAS) and the North American Land Data Assimilation System (NLDAS); the major differences between GLDAS-2 and GLDAS-1, and NLDAS-2 and NLDAS-1; as well as data access and exploration tools, such as Mirador searching and ordering, parameter subsetting and file format conversion, and Giovanni online visualization and analysis.

Issues and Solutions for Bringing Heterogeneous Water Cycle Data Sets Together

J. G. Acker; S. J. Kempler *; W. L. Teng; D. R. Belvedere; Z. Liu; G. G. Leptoukh

Poster, Moscone South, H31H-1105

What it's about: This presentation expands on the findings of the Collaborative Energy and Water Cycle Information Services (CEWIS) Workshop. It also demonstrates the CEWIS prototype shown at the workshop, which illustrated the potential implantation of new technologies that can mitigate data access roadblocks encountered in multi-data set research.

Retrospective Analog Year Analyses Using NASA Satellite Precipitation and Soil Moisture Data to Improve USDA's World Agricultural Supply and Demand Estimates

William L. Teng ; H. Shannon

Poster, Moscone South, B33C-0417

What it's about: In this study, NASA satellite precipitation and soil moisture time series are used to identify analog years. [Analog years are those time series of hydrological parameters (e.g., precipitation, soil moisture from surface weather stations or satellites) from historical years that are similar to the time series of a "target" year.] Given that soil moisture often has a more direct effect than does precipitation on crop water availability, the time series of soil moisture could be more effective than that of precipitation, in identifying those years with similar crop yields. Retrospective analyses of analogs will be conducted to determine any reduction in the level of uncertainty in identifying analog years, and any reduction in false negatives or false positives.

Estimation of Surface Air Temperature from MODIS High Resolution Land Surface Temperature over Northern China

Suhung Shen, Gregory G. Leptoukh, and Irina V. Gerasimov

Poster, Moscone South, GC33A-0920

What it's about: In this study, the statistical relationships between surface air temperatures and MODIS land surface temperature over Northern China at selected locations are examined. Results indicate that the statistical significance of the estimations depends on the surface type and conditions. As part of the MAIRS Project, NASA GES DISC has processed the standard 8-day 1km MODIS product by mosaicking and re-projecting 10x10 degree tiled data files over the entire monsoon Asia region and made the data accessible through the online visualization and analysis system, Giovanni.

Combining hydrological modeling and remote sensing observations to enable data-driven decision making for Devils Lake flood mitigation in a changing climate

X. Zhang *; Y. H. Lim; W. L. Teng; A. Kirilenko

Talk, Moscone West 3016, 5:45 PM, H34C-08

What it's about: The water level of Devils Lake in North Dakota has been rising since 1993, reaching record highs in each of the past three years. Nearly \$1 billion have already been spent in mitigating the flooding impacts. We have implemented a distributed rainfall-runoff model, HEC-HMS, to simulate the hydro-dynamics of the lake watershed, and used NASA's remote sensing data, including the TRMM Multi-Satellite Precipitation Analysis (TMPA) and AIRS surface air temperature, to drive the model. The watershed hydrological model is coupled with a reservoir model, HEC-ResSim. The coupled models can reproduce water level of the lake at sub-feet accuracy, and will be driven by the downscaled CMIP-3 projections of future climate, to provide decision support for mitigation measures in response to the potential flooding.

Thursday, December 16

3D Online Visualization and Synergy of NASA A-Train Data using Google Earth

Aijun Chen *; Steven J. Kempler; Gregory G. Leptoukh; Peter M. Smith

Poster, Moscone South, ED41C-0648

What it's about: Currently, Google Earth's plug-in in Web browser is integrated with GES DISC's online analysis system as a virtual three-dimensional platform. Multiple Google Earth windows are available in one browser window for users visualizing, comparing and synergizing online Earth science data, particularly data from the 'A-Train' satellite constellation. By utilizing GES DISC's online system, users can interactively select and refine their data products of interest and then generate downloadable KMZ files. These KMZ files are automatically opened in the user's Google Earth client.

Experiences Developing A User-centric Presentation of A Domain-enhanced Provenance Data Model

C. Chang; S. Zednik ; Christopher Lynnes; P. A. Fox; D. L. McGuinness; Gregory G. Leptoukh; Jianfu Pan

Talk, Moscone South 302, 2:55 PM, IN43C-06

What it's about: Web-based science analysis and processing tools allow users to access, analyze, and generate visualizations of data without requiring the user manage data processing. These tools streamline science analysis activities by significantly reducing the data processing overhead for the user. The benefits of these tools come with a cost - the increased need for transparency in what data processing the tool performed on behalf of the user. By providing a clear explanation of what processing was performed and what domain-knowledge (assumptions, caveats, etc) modulated that processing we can increase user trust, understanding, and accountability and reduce misinterpretation or generation of inconsistent results. We will describe our knowledge provenance solution infrastructure in action. A demonstration will include presentation capabilities using an integrated semantic data model, supporting provenance and science domain models, applied to an existing web-based Earth science data analysis tool (e.g. Giovanni from NASA/GSFC).

Metadata Evolution for NASA's Earth Science Data Systems

S. S. Khalsa; E. M. Armstrong; S. F. Browdy ; H. Conover; T. Habermann; Christopher Lynnes; A. Mitchell; Lola M. Olsen; J. L. Pals; B. H. Weiss

Talk, Moscone South 302, 10:20 AM, IN42A-01

What it's about: NASA has formed a team of data systems and metadata experts to analyze requirements and recommend the best approach for NASA Earth Science data systems to transition to the ISO 19100 series of standards. The team is considering the applicability, limitations, and possible profiles of this standard for the diverse data sets maintained by NASA data centers and missions. The team's initial findings and recommendations regarding to how reach the interoperability goals of NASA using these standards will be presented.

Data Access Services that Make Remote Sensing Data Easier to Use

Christopher Lynnes

Talk, Moscone South 302, 11:05 AM, IN42A-04

What it's about: The Goddard Earth Sciences Data and Information Services Center is deploying a variety of data access services that are designed to dramatically shorten the time consumed in the data preparation step. On-the-fly conversion to the standard network Common Data Form (netCDF) format with Climate-Forecast (CF) conventions imposes a standard coordinate system framework that makes data instantly readable through several tools. A similar benefit is achieved by serving data through the Open Source Project for a Network Data Access Protocol (OPeNDAP), which also provides subsetting. The Data Quality Screening Service goes a step further in filtering out data points based on quality control flags, based on science team recommendations or user-specified criteria. Further still is the Giovanni online analysis system which goes beyond handling formatting and quality to provide visualization and basic statistics of the data.

Eight Year Climatology from observational (AIRS) and model (MERRA) data

Thomas J. Hearty; Andrey K. Savtchenko; Young-In Won; Michael Theobald; Bruce Vollmer; E. Manning; Peter M. Smith; Dana Ostrenga; Gregory G. Leptoukh

Poster, Moscone South, A43B-0213

What it's about: Climatologies derived from eight years of temperature, water vapor, cloud, and trace gas observations made by the Atmospheric Infrared Sounder (AIRS) instrument flying on the Aqua satellite are examined, and compared to similar climatologies constructed with data from a global assimilation model, the Modern Era Retrospective-Analysis for Research and Applications (MERRA). AIRS climatologies are used to examine anomalies and trends in the AIRS data record.

Friday, December 17

Information Technology Infusion Case Study: Integrating Google Earth into the A-Train Data Depot

Peter M. Smith; Steven J. Kempler *; Gregory G. Leptoukh; Aijun Chen

Poster, Moscone South, IN51B-1147

What it's about: Successful integration of Google Earth into the A-Train Data Depot (ATDD), resulted in: (a) visualizing two-, three- and four-dimensional Earth science data on Google Earth; (b) visualizing and synergizing analyzed results derived from the Giovanni online analysis system; and (c) visualizing results derived from other standard web services (e.g. OGC WMS). This presentation will discuss the challenges and non-challenges encountered, and innovative solutions implemented, to enable displaying NASA vertical and horizontal Earth science data within Google Earth technology.

Happy Holidays from the NASA Goddard Earth Sciences Data and Information Services Center –

the people who bring you Giovanni !

